Medford Bureau of Land Management
3040 Biddle Road
Medford, Oregon 97501

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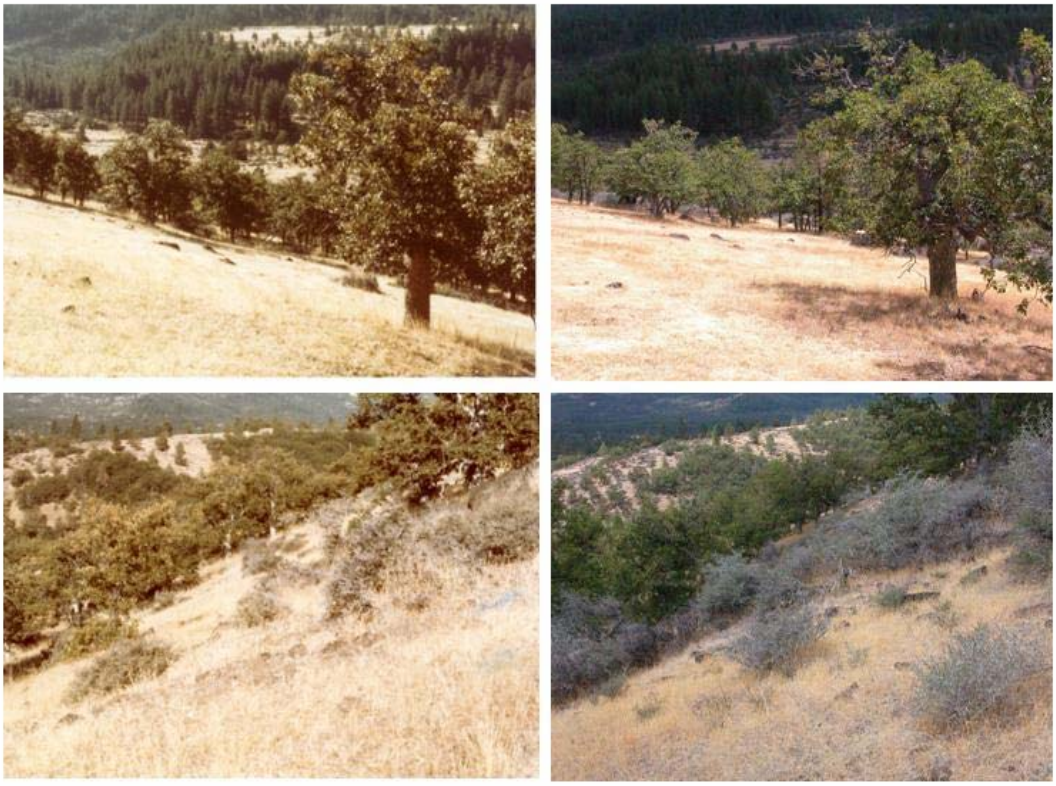
Jenny Creek Allotment –

STANDARDS OF RANGELAND HEALTH ANALYSIS



The Soil Vegetation Inventory Method (SVIM) photos on the left were taken in 1980 and the photos on the right were retaken In 2004

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INTRODUCTION

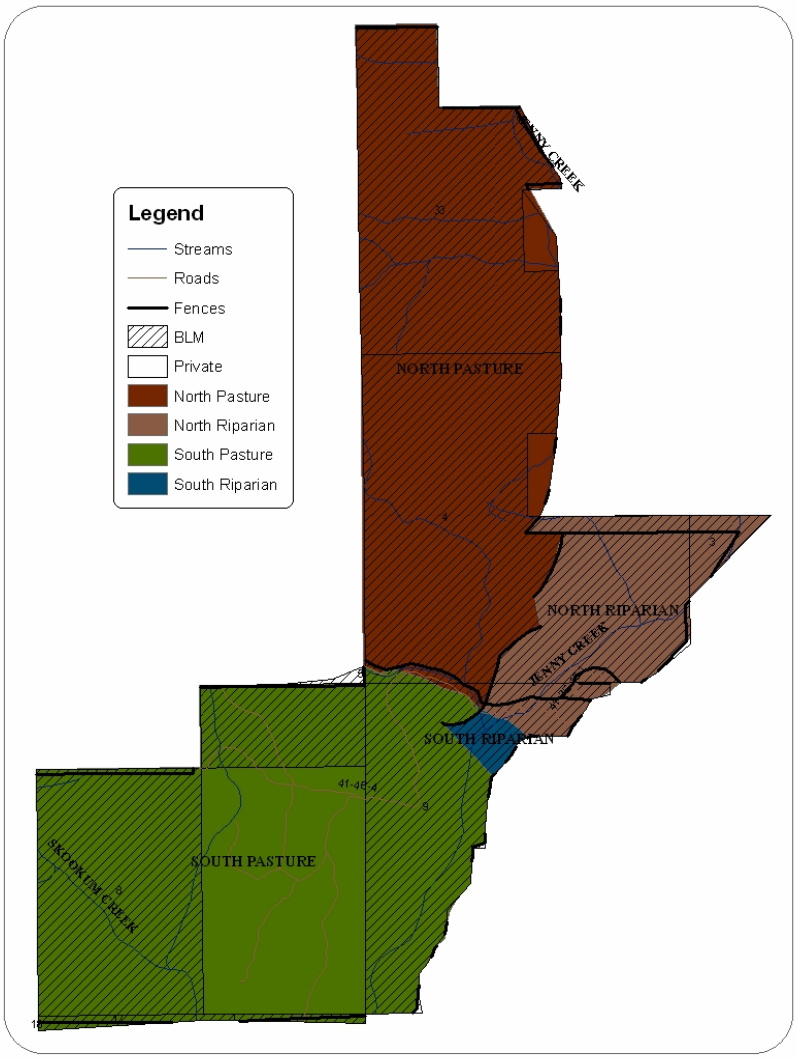
This is an Oregon/Washington Bureau of Land Management (BLM) Standards of Rangeland Health Evaluation that addresses the Jenny Creek Allotment (10108). The Jenny Creek Allotment is located south of the Greensprings Highway in T. 41 S., R. 4 E., Sections 33, 4, 5, and 8 Willamette Meridian. The entire allotment is approximately 1,682 acres. The BLM-managed portion of the allotment is 1,417 acres with 30 cows permitted from May 15–September 10 for a total of 115 AUMs (Animal Unit Months). The Jenny Creek allotment is split into four partially fenced pastures and is managed under the Jenny Creek Allotment Management Plan (Table 1 and Map 1).

Table 1. *Grazing Schedule*

Grazing Schedule	
Year 1	**Year 2**
South Pasture 5/15-6/30	North Pasture 5/15-7/15
South Riparian 7/1-7/5	North Riparian 7/16-7/20
North Riparian 7/6-7/10	South Riparian 7/21-7/25
North Pasture 7/11-9/10	South Pasture 7/26-9/10

The Jenny Creek Allotment is within the Cascade-Siskiyou National Monument (CSNM). The CSNM was reserved in June 2000 by presidential proclamation in recognition of its remarkable ecology and to protect a diverse range of biological, geological, aquatic, archeological, and historic objects. The ecological sites of the monument support special status plants and animals, productive wildlife habitat, fisheries, visual resources, and provide recreational opportunities. Riparian habitat and fisheries management issues have been the focus of most management actions and ongoing grazing adjustments.

Map 1. *Map of the Jenny Creek Allotment Pastures*



Vegetation

Vegetation in the Jenny Creek Allotment is comprised primarily of oak woodland, shrubland, and grassland. The tree species are predominately Oregon white oak (*Quercus garryana)* with a smaller component of California black oak (*Quercus kelloggii)*, Ponderosa Pine (*Pinus ponderosa)*, and Douglas fir (*Pseudotsuga menziesii)*. The shrub component is a mixture of buckbrush (*Ceanothus cuneatus)*, serviceberry (*Amelanchier alnifolia*), and deer brush (*Ceanothus integerrimus)*. Ground cover consists of an assortment of grass and forbs including blue wild rye (*Elymus glaucus)*, Lemmon's needlegrass (*Achnatherum lemonni)*, Idaho fescue *(Festuca idahoensis)*, California oatgrass (*Danthonia californica)*, squirrel tail (*Elymus elymoides)*, prairie junegrass (*Koeleria macrantha)*, California Brome (*Bromus carinatus)*, Secund's bluegrass (*Poa secunda)*, Western buttercup (*Ranunculus occidentalis)*, yampah (*Perideridia sp.)*, harvest brodiaea (*Brodiaea elegans*), slender phlox (*Microsteris gracilis*), tarweed (*Madia sp.)*, lupine (*Lupinus sp.)*, and paintbrush (*Castilleja sp.)* The dry meadows are generally less productive and vulnerable to invasive plant influences from species including medusahead (*Taeniatherum caput-medusea)*, soft brome (*Bromus mollis)*, cheatgrass (*Bromus tectorum)*, bristly dogstail (*Cynosurus echinatus)*, yellow starthistle (*Centaurea solstitialis*), bulbous bluegrass (*Poa bulbosa)* and a variety of other weedy species.

Soils

Soils on the south portion of the Western Cascade are typically Randcor, McNull, Shoat, and Skookum. The McNull, Shoat and Skookum soils are moderately deep, well drained soils with gravels, cobbles or stones on the surface. Permeability of these soils is slow or moderate. The Skookum soil consists of monmorillonitic clay which shrink and swell. The Randcor soil is very shallow (<10") moderately well drained with a stony loam surface. The permeability of the Randcor soil is moderate and ponding on this soil is evident in January and February. The combination of shrink-swell clays and low precipitation result in soils that are naturally, sparsely vegetated at many sites.

Soils with clayey subsoil (McNull and Skookum) have low strength when wet, while sediment derived from these soils is fine and stays suspended for extended periods of time, and is susceptible to cut bank failures and turbid runoff. Other soils that may be identified but to a minor extent include Campfour-Paragon complex, located on table land and/or plateaus, and Carney clay on footslopes and fans. The Campfour-Paragon complex is a mix of a deep, loamy soil and a moderately deep, cobbly soil intermingled across the landscape. Permeability of both of these soils are moderately slow and the potential for water erosion being moderate. Carney clay also shrinks and swells due to mineralogy which would limit plant growth.

Hydrology

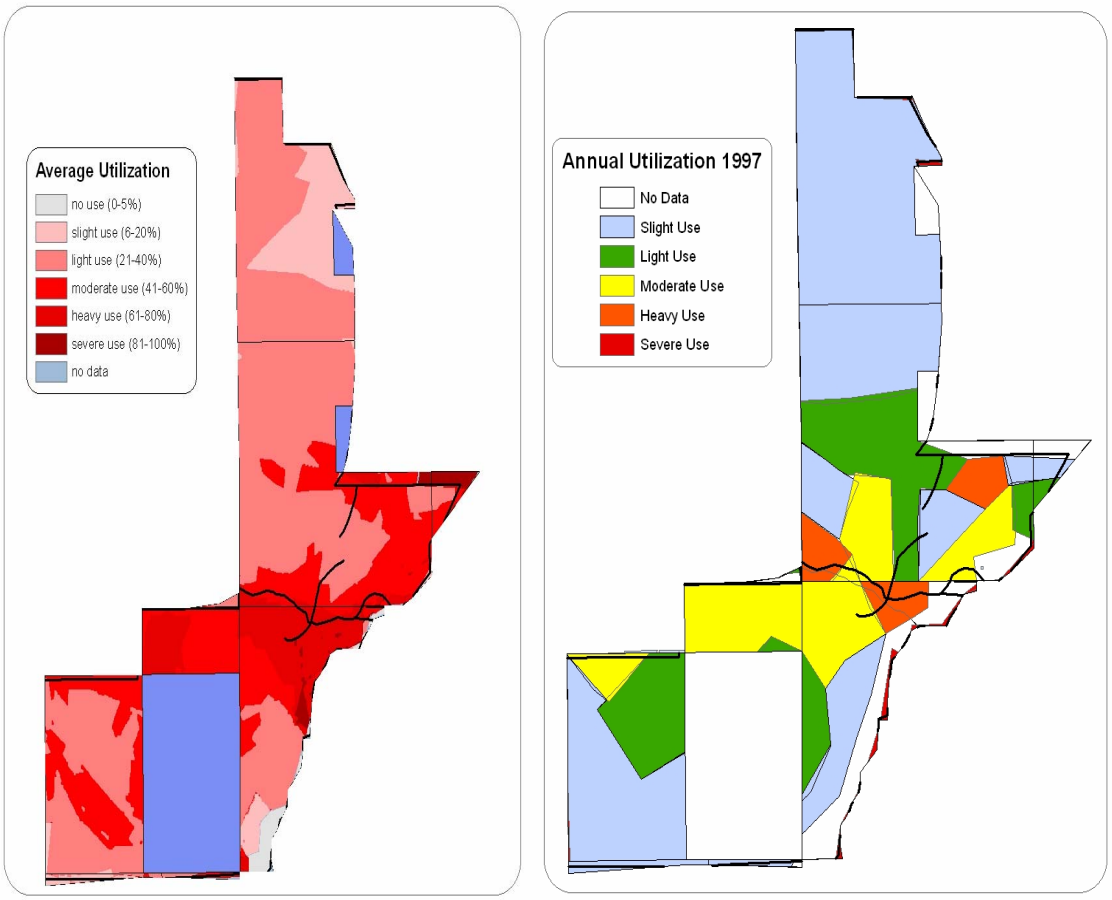
The Jenny Creek Allotment encompasses a segment of the Jenny Creek mainstem, Skookum Creek, and tributaries to both. Skookum Creek is a tributary to Jenny Creek, a Klamath basin stream that flows into the Irongate Reservoir in northern California. Within the allotment boundary, there are 3.4 miles of perennial streams, 3.8 miles of intermittent streams, and 1.5 miles of dry draws.

Utilization Mapping, Transect Data and Actual Use

Utilization data is collected using the key species method and mapping use zones (TR 4400-3, 1996). A seven class delineation is used (No Use: 0-5 percent, Slight Use: 6-20 percent, Light Use: 21-40 percent, Moderate Use: 41-60 percent, Heavy Use: 61-80 percent, Severe Use: 81-100 percent). A composite map of utilization was created using data collected between the years of (1986-1997) to illustrate the use over time within the allotment and corresponds with the studies associated with the Livestock Impact Studies. The average map does not depict the changes in use patterns after pasture fencing in 1990 so we have included the utilization map from 1997 which reflects the changes in management (Map 2).

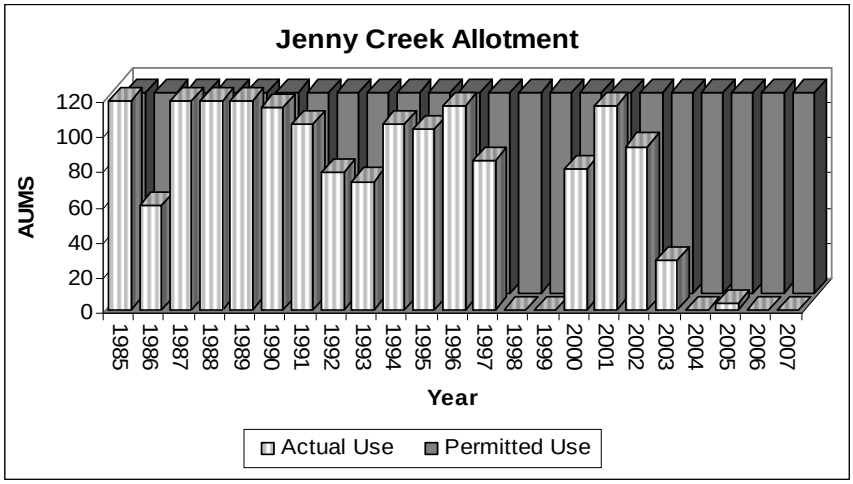
Utilization mapping and transect data collected shows and overall decrease in utilization over the past decade. There has been little to no use in the last four years on the Jenny Creek Allotment (Hosten et al 2007a). Current conditions reflect the four years of rest that the allotment has received.

Map 2. *Map of Average Livestock Utilization and Utilization from 1997 in the Jenny Creek Allotment*



The actual use is currently lower than the permitted use (Figure 1). The permitted use is the AUMs authorized in the *Medford District Resource Management Plan* (1995).

Figure 1. *Actual Use Data*



ASSESSMENT

Rangeland Health Assessments are required on each allotment prior to consideration of grazing lease renewal. These assessments are conducted by an interdisciplinary team of resource specialists who assess ecological processes, watershed functioning condition, water quality conditions, special status species, and wildlife habitat conditions on an allotment. Assessments include field visits to the allotment and evaluation of all available data. All available data, including the results of the Livestock Impacts Study, will be used to make an overall assessment of rangeland health as described in the *Standards for Rangeland Health and Guidelines and Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington* (Standards and Guidelines) (USDI 1997), in light of the Fundamentals of Rangeland Health at 43 CFR 4180.1.

The Standards and Guidelines identify five specific standards that are used to determine the degree to which "ecological function and process exist within each ecosystem." Standards address the health, productivity, and sustainability of the BLM-administered public rangelands and represent the minimum acceptable conditions for the public rangelands. The guidelines are management practices that will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes.

The Standards and Guidelines also specify a set of potential indicators for use when determining whether or not standards are being met. The Livestock Impacts Study has been designed to provide information regarding many of these potential indicators. The results of the Livestock Impacts Study will be used in conjunction with other available data to determine whether or not the grazing standards are being met under current grazing practices.

This assessment summarizes existing resource conditions on the Jenny Creek Allotment using information derived from the Livestock Impacts Study, rangeland field assessments; BLM monitoring data; and all other available data in relation to the five specific standards described in the Standards and Guidelines (USDI 1997).

Primary Supporting Data

Data used by the BLM to support this assessment includes, but is not limited to, the following studies and monitoring projects.

Livestock Impacts Studies: This collection of reports includes studies that provide a historic and spatial context to the examination of individual plant and wildlife species. Historic anecdotes and photos provide a glimpse of vegetation condition at the time of Euro-American settlement and the remainder of the 19th century. More recent plot (range trend plots) and stand examinations (derived from Natural Resources Conservation Service and Soil and Vegetation Inventory Method) provide a baseline for re-examining change over the past 30 years. Other studies focus on the distribution of weeds, Greene's mariposa lily, native ungulates, aquatic macroinvertebrates, and the Jenny Creek Sucker. All of the above species are examined relative to patterns in topography, vegetation, soils, past management, and utilization by native and non-native ungulates.

Rangeland Health Field Assessments: Field assessments using the protocol described in *Technical Reference 1734-6: Interpreting the Indicators of Rangeland Health* (USDI and USDA 2005) were conducted August 2, 2007 at two different ecological sites on the Jenny Creek Allotment: loamy slopes and, loamy shrub scabland. Line-point-intercept transect data was collected at each of the ecological sites. The transect data collected provides quantitative data on percent bare ground, species composition, plant mortality and decadence, litter cover and

dominance of invasive plants.

Stream Temperature Monitoring: Seasonal 30-minute interval stream temperature data is collected at one site on Jenny Creek in the North Riparian Pasture in this allotment; nine sites on Jenny Creek north of the allotment; two sites in Oregon Gulch; and one location on Parker Creek north of the allotment using USGS and Oregon DEQ-established methodologies. Changes in riparian vegetative cover, channel dimensions, and bank/floodplain water storage are known to influence stream temperature. Temperature monitoring data assists in assessment of Aquatic Conservation Strategy (ACS) Objectives 2, 4, and 9 (USDA/USDI 1994b); for assessment of compliance with state water quality standards; and assists in development of State of Oregon/EPA-required Water Quality Management Plans for the area.

Gaging Station and Staff Gages: Flow and Water Quality Assessment: Calculation and assessment of peak, high, and low flows is extremely difficult without actual field measurement and reference over time. Flow data is also required for the meaningful analysis of water quality parameters. Because of rapid fluctuation in stream levels, continuous records are required at a key location to interpret data collected in non-continuous sampling from other locations. Monthly grab samples of turbidity, air temperature, water temperature, pH, flow, fecal coliform, and dissolved oxygen are collected at 11 existing locations within the CSNM. Streamflow data is collected at the monitoring site on Jenny Creek in the North Riparian Pasture in this allotment. A continuous record (15-minute interval) of stream stage, water and air temperature is collected at one location in the CSNM. Standard USGS, Oregon DEQ and EPA approved protocols are used in the data collection.

Stream Channel Cross-Sections: Monumented stream cross-section measurements are collected at the monitoring site on Jenny Creek in the North Riparian Pasture in this allotment; eight locations on Jenny Creek north of the allotment; and on Parker Creek north of the allotment. Measurement methodologies include standard cadastral survey techniques and those outlined in Rosgen (1996). Sites are measured at five-year intervals (approximately) and after major flood events. Cross-sections provide a reference point from which to document changes in channel morphology, conduct flow measurements, and estimate flood flows. Documentation of changes in channel morphology provides an indication of stability and functioning of the upstream surface hydrologic system.

Rain Gages: Rainfall data is collected at 15-minute intervals at one site in lower Jenny Creek using tipping bucket rain gage. Daily precipitation is collected at Howard Prairie Dam (NOAA), Parker Mountain (RAWS), and Buckhorn Springs (RAWS). Daily snowfall and snow-on-the-ground is collected at Howard Prairie Dam (NOAA). Assessment of hydrologic response and water quality parameters, as well as many other aspects of ecosystem function, can only be analyzed accurately in the context of recent precipitation. Although year-to-year trends in precipitation tend to be uniform over an area the size of the CSNM, there is substantial variability in precipitation between locations based on terrain, elevation, etc. Precipitation data from a number of sites at varying elevations and locations in and around the monument is needed for interpretation of related data including hydrologic and vegetation conditions.

Aquatic Macroinvertebrate Monitoring: Macroinvertebrate monitoring has been conducted by Aquatic Biology Associates at one site in the allotment using methods that meet or exceed state or EPA protocols for the sampling of benthic macroinvertebrates. Taxa abundance, taxa richness, and other metrics are measured at 5-6 year intervals. Numerous springs throughout the monument were sampled for aquatic mollusk presence, species data, and livestock impacts (Frest and Johannes 2005, BLM 1999-2006). Livestock grazing was measured by a combination of factors

(stubble height, trampling, presence of feces, bank destabilization, and bare ground) and was rated on a scale with the same range, as follows: 1- nil or nearly so; 2- light; 3- moderate; 4- heavy; 5- severe. These are not claimed to be quantitative measures but merely attempts to divide a complex range continuum, often multi-faceted in cause, into more or less proportionate segments (Frest and Johannes 2005).

Botany Surveys: Botany surveys were conducted on the Jenny Creek Allotment in 2007 using the Intuitive Controlled Survey. This method includes a complete survey in habitats with the highest potential for locating Special Status Species. The surveyor traverses through the project area enough to see a representative cross section of all the major habitats and topographic features, looking for the target species while en route between different areas. Most of the project area has been surveyed. When the surveyor arrives at an area of high potential habitat (that was defined in the pre-field review or encountered during the field visit), a complete survey for the target species was made.

Wildlife Surveys: Surveys have been conducted in the allotment for amphibians, falcons and bats using established protocols. Deer trend counts are also conducted by Oregon Department of Fish and Wildlife.

Standard 1: Watershed Function – Uplands
To meet this standard, upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform.

This standard focuses on the basic physical functions of upland soils that support plant growth, the maintenance or development of plant populations and communities, and promote dependable flows of quality water from the watershed.

To achieve and sustain rangeland health, watersheds must function properly. Watersheds consist of three principle components: the uplands, riparian/wetland areas and the aquatic zone. This standard addresses the upland component of the watershed. When functioning properly, within its potential, a watershed captures stores and safely releases the moisture associated with normal precipitation events (equal to or less than the 25 year, 5 hour event) that falls within its boundaries. Uplands make up the largest part of the watershed and are where most of the moisture received during precipitation events is captured and stored.

While all watersheds consist of similar components and processes, each is unique in its individual makeup. Each watershed displays its own pattern of landform and soil, its unique climate and weather patterns, and its own history of use and current condition. In directing management toward achieving this standard, it is essential to treat each unit of the landscape (soil, ecological site, and watershed) according to its own capability and how it fits with both smaller and larger units of the landscape.

Indicators Used to Evaluate this Standard:
The following set of indicators has been identified for subsequent use to determine if this standard is being met.

Amount and distribution of bare ground, rock, stone, gravel, plant litter, and plant cover:
Upland sites with bare soil consequent to past disturbance (scarifications, livestock, and road construction) show less bare soil and succession towards perennial plant domination. Other sites

appear to maintain a bare soil surface because of soil mineralogy. The Natural Resource Conservation Service (NRCS) describes montmorillonitic soils through much of the region (USDA 1993). The combination of shrink-swell clays and low precipitation results in naturally bare soil at many low elevation sites.

The two Rangeland Health Field Assessment (RHFA) ecological sites visited (loamy slopes and loamy shrub scabland) both showed levels of bare ground consistent with what would be expected at those ecological sites (USDI 2007).

Plant community composition and community structure: Vegetation in the Jenny Creek Allotment is dominated by oak woodlands; dry meadows in the upland pastures; and riparian in the pastures along Jenny Creek. Occurrences of broadleaved noxious weed invasion indicate areas of deteriorating plant composition. Yellow starthistle is associated with several environmental and managerial factors including the presence of shrink-swell clays, past management activities (scarification and seeding) and areas subject to high livestock influence (trampling and forage intake) within prairies and open woodlands (Hosten 2007a).

Repeat photos show an increase in the percent cover by shrub vegetation (mostly buckbrush) through parts of the Jenny Creek Allotment. The RHFA at a droughty fan ecological site showed an accumulation of shrubs since the last fire and intense, season-long grazing (late 19^{th} – early 20^{th} centuries) by cattle, sheep, and horses.

Bulbous bluegrass, a short-lived non-native perennial grass, shows the largest increase in extent and cover abundance in a wide range of plant communities across the allotment. Bulbous bluegrass appears more strongly related to physical disturbance along roads, past rangeland improvements, and topographic variables than livestock utilization (Hosten et al. 2007d). Bulbous bluegrass is indirectly related to livestock by its association with gentle slopes. Bulbous bluegrass was recorded in both of the RHFA transects (USDI 2007).

Accelerated erosion and overland flow: The incised nature of many of the watercourses in these pastures indicates severe erosion in the past. Historic photos indicate livestock may have played a role in the incision of the watercourses entering Jenny Creek. Riparian pasture fencing and rotational grazing have resulted in considerable improvement in the riparian vegetation (Hosten and Whitridge 2007, Hosten 2007b). In the RHFA, there are six indicators pertaining to erosion: one site showed departure from the ecological site description. The loamy shrub scabland site indicated a slight-to-moderate departure for water flow patterns and pedestals and/ or terracettes (USDI 2007).

Root occupancy in the soil profile: The general trend in herbaceous vegetation from annual domination towards perennial vegetation (Hosten et al. 2007d) indicates improved root occupancy of the soil profile through much of the Jenny Creek Allotment (Hosten et al. 2007d, USDI 2007). The development of a dense woody plant dominated riparian strip along Jenny Creek over the past decade has likely increased the riverbank stability (Hosten and Whitridge 2007, Hosten 2007b).

Road density: The Jenny Creek Allotment is located entirely within the Lower Jenny Creek Level 6 Subwatershed. The road density within the Lower Jenny Creek Subwatershed is 2.95 mi./mi.^{2}. Roads are associated with impaired hydrologic function; loss of connectivity; introduction and spread of exotic species and noxious weeds (Hosten 2007a); reductions in site productivity; and increased sediment production.

Standard 2: Watershed Function - Riparian/Wetland Areas
To meet this standard, riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.

Riparian-wetland areas include standing water systems such as lakes, ponds, seeps, bogs, and meadows; and moving water systems such as rivers, streams, and springs. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation typically adapted to life in saturated soil conditions. Riparian areas commonly occupy the transition zone between the uplands and surface water bodies (the aquatic zone) or permanently saturated wetlands.

Properly functioning condition of riparian and wetland areas describes the degree of physical function of these components of the watershed. Their functionality is important to water quality in the capture and retention of sediment and debris, the detention and detoxification of pollutants, and in moderating seasonal extremes of water temperature. Properly functioning riparian areas and wetlands enhance the timing and duration of streamflow through dissipation of flood energy, improved bank storage, and ground water recharge. Properly functioning condition should not be confused with the Desired Plant Community (DPC) or the Desired Future Condition (DFC) since, in most cases, it is the precursor to these levels of resource condition and is required for their attainment.

Indicators Used to Evaluate this Standard:
The following set of indicators has been identified for which site-specific criteria will be used subsequently to determine if this standard is being met. The criteria are based upon the potential (or upon the capability where potential cannot be achieved) of individual sites or land forms.

Active/stable beaver dams: The rapid development of willow stands since riparian pasture development has improved conditions for beaver along Jenny Creek. While evidence of willow harvest by beaver is common along the watercourse, improvement in habitat has not yet resulted in beaver dam construction within the Jenny Creek Allotment.

Vegetation age class distribution and community structure: Stream Channel riparian areas show improvement in age class distribution and community structure. Much of this improvement is due to natural successional processes following past flood events and improved livestock management. Changes in season-of-use and reduction in livestock numbers appear partly responsible for the increased extent of sedges, rushes and riparian woody vegetation (Hosten and Whitridge 2007).

Large wood and surface litter: Repeat photos show no difference in large wood between grazed and ungrazed areas (Hosten and Whitridge 2007). ODFW Surveys conducted in 2003 found large wood volume well below the benchmark and the stream segment surveyed lacked any key wood pieces.

Frequency and duration of soil saturation: The frequency and duration of flooding are controlled by topographic position, seasonal rainfall patterns, and influence of beaver. Exclosure studies indicate heavy livestock use impedes the development of willow stands (Hosten 2007b).

Plant composition: Stream channel riparian areas show considerable improvement in vegetation composition expressed as the establishment of vegetation on bare ground; replacement of grass

by sedge; and replacement of herbaceous vegetation by riparian shrubs depending on the site (Hosten 2007; Hosten and Whitridge 2007). Streamside riparian areas are generally improving throughout the allotment compared to historic times. The expansion of sedges and or woody riparian vegetation implies that there has been an increase in streamside root mass providing adequate streambank stabilization (Hosten 2007; Hosten and Whitridge 2007). Riparian vegetation associated with seeps and springs generally do not show the same improvement as streamside riparian areas. Since the development of the Jenny Creek pasture in 1995, seeps and springs show rapid development of perennial riparian vegetation.

Point bar revegetation: Repeat photos taken along Jenny Creek show rapidly revegetating pointbars following fencing of the riparian pastures. (Hosten 2007b, Hosten and Whitridge 2007).

Root mass: The expansion of sedges and or woody riparian vegetation suggests that there has been an increase in streamside root mass critical to stream stability (Hosten 2007b, Hosten and Whitridge 2007).

Sediment deposition: An ODFW Physical Habitat Survey (2002) was conducted on a segment of Jenny Creek (T40S R4E Section 4) in the allotment. Scour pools and riffles with an average gradient of one percent dominated this reach. Fine and organic sediments were measured at a very high level (45 percent), well above the ODFW benchmark set for aquatic organisms. High sediment is due in part to the upstream reservoir system that moderates the magnitude and intensity of winter flushing flows. BLM Stream Surveys and PFC Assessments have not been collected on this part of Jenny Creek or Skookum Creek.

Streambank /shoreline stability: Riparian banks along Jenny Creek showed severe erosion in the past, resulting in projects aimed at stabilizing cutbanks. Logs were cabled to prevent high, wet season flows from further damaging streambanks. Repeat photos indicate that riparian condition has improved in the last decade, likely leading to improved streambank stability (Hosten and Whitridge 2007).

Upland watershed conditions: No logging has occurred on public lands within the allotment during the last few decades. The major management influences on upland condition that might influence riparian condition remain roads and livestock grazing. Heavy (60-80 percent) utilization levels by livestock outside of riparian areas are restricted to a few areas.

Amount and distribution of plant cover: Repeat photos show the loss of bare ground to vegetation cover throughout the CSNM (Hosten and Whitridge 2007). This is particularly evident in photo-retakes along Jenny Creek since the creation of the riparian pastures.

Road density: The Jenny Creek Allotment is located entirely within the Lower Jenny Creek Level 6 Subwatershed. The road density within the Lower Jenny Creek Subwatershed is 2.95 mi./mi.^{2}. Roads within riparian areas can greatly influence aquatic and riparian conditions. Roads contribute to the disruption of aquatic connectivity, large wood and nutrient storage regimes, peak flow routing, aquatic habitat complexity, temperature regimes, channel morphology, and direct sediment inputs from road failures. The matrix of pathways and indicators for the Klamath Province/Siskiyou Mountains considers road densities of less than 2.0 mi./mi.^{2} as properly functioning condition and greater than 3.0 mi./mi.^{2} as not properly functioning (ODFW 2002, 2003).

Amount and distribution of bare ground, rock, stone, gravel, plant litter, and plant cover: Studies examining riparian vegetation change over time identify a decline in bare ground within

streamside riparian areas. Bare ground is usually colonized by grasses and sedges, sometimes replaced in turn by woody riparian areas (Hosten and Whitridge 2007).

Standard 3: Ecological Processes

To meet this standard, healthy, productive, and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

This standard addresses the ecological processes of energy flow and nutrient cycling as influenced by existing plant and animal communities. While emphasis may be on native species, an ecological site may be capable of supporting a number of different native and introduced plant and animal populations and communities while meeting this standard. This standard also addresses the hydrologic cycle which is essential for plant growth and appropriate levels of energy flow and nutrient cycling.

The ability of plants to capture sunlight energy, to grow and develop, plays a role in soil development and watershed function. Nutrients necessary for plant growth are made available to plants through the decomposition and metabolization of organic matter by insects, bacteria and fungi, the weathering of rocks and extraction from the atmosphere. Nutrients are transported through the soil by plant uptake, leaching and by rodent, insect and microbial activity. They follow cyclical patterns as they are used and reused by living organisms.

The ability of rangelands to provide habitat for wildlife and satisfy social and economic needs depends on the buildup and cycling of nutrients over time. Interrupting or slowing nutrient cycling can lead to site degradation, as these lands become increasingly deficient in the nutrients plants require.

Some plant communities, because of past livestock use, fire frequency, or other past extreme or continued disturbances, are incapable of meeting this standard. For example, shallow-rooted winter-annual grasses that completely dominate some sites do not fully occupy the potential rooting depth of some soils, thereby reducing nutrient cycling well below optimum levels. In addition, these plants have a relatively short growth period and thus capture less sunlight than more diverse plant communities. Plant communities like those cited in this example are considered to have crossed the threshold of recovery and often require great expense to be recovered. The cost of recovery must be weighed against the site's potential ecological/economic value in establishing treatment priorities.

Indicators Used to Evaluate this Standard:

The following set of indicators has been identified for subsequent use to determine if this standard is being met.

Accumulation, distribution, and incorporation of plant litter into the soil: Litter accumulation in upland areas is thought to conserve soil moisture within the soil profile, protect the soil surface from raindrop impact, and help prevent the establishment and persistence of broadleaved weeds with winter rosettes. A litter layer may also prevent the establishment and persistence of native grasses, forbs, and rare plants. Two of the sites analyzed as part of the RHFA had litter amounts below the expected percentage due to the high abundance of annual grass. Livestock movement is thought to improve contact between the soil and litter thereby promoting decomposition and enhancing the nutrient cycle. Removal of decadent forage through grazing and defecation is considered to promote the energy cycle by enhancing the plants ability to trap radiant energy on

new plant tissues. The accumulation of litter in riparian areas can favor native sedges and rushes and confer habitat for macro-invertebrates, amphibians, reptiles and other wildlife species, while at the same time reducing the overall productivity of the site. This is demonstrated by changes observed on the former Box O Ranch and other former heavy-use areas. The positive and negative aspects of a litter layer are different at individual sites, and are not suitable for ecological interpretation across the landscape characterized by a diverse pattern of vegetation and grazing intensities.

Wildlife community structure: Livestock influence deer and elk movement, although it is not known if livestock alter native ungulate community structure or population beyond the constraints of suburban and agricultural expansion into former deer elk winter range. While richness and diversity of small mammals is not influenced by livestock grazing in riparian, woodland, and mixed conifer communities, small mammal biomass is less in moderate to severe utilization levels versus ungrazed or lightly grazed areas (Johnston and Anthony. In review a, b).

Birds: Ungulate use appears to lead to an increase in abundance of ground nesting birds, but may not favor overall reproductive success by these species. This may result from a decrease in the cover of shrubs which provides more nest sites for ground-nesting birds. Ungulate use has a negative influence on abundance of shrub-nesting birds including migratory neo-tropical birds (Alexander et al. 2008). It is not known if the increased abundance of shrubs found in formerly open fire-mediated plant communities (Hosten et al. 2007c) compensates for livestock influence on shrub nesting bird species.

Butterflies: Ungulate utilization has been shown to negatively influence the Great Basin wood nymph, a butterfly dependent on grass species for its lifecycle. Other butterflies with grass host plants (e.g. mardon skipper) may experience similar negative influences (Runquist In prep.).

Biological activity including plant growth, herbivory, and rodent, insect and microbial activity: Historic browsing by livestock within current winter deer and elk habitat is thought to have contributed to winter native ungulate die-off. Changes in the timing of grazing have reduced the level of browsing at lower elevation, thus eliminating the conflict between native and non-native ungulates. Shrub growth in previously reported areas of heavy browsing now appears normal (Hosten et al. 2007b).

Plant composition: Observations about the ecological process of plant community change (succession) suggest several influences on current vegetation composition. Elapsed time since the last fire is expressed in conifer dominated communities by an increase in canopy cover by saplings, and the loss of mature black oak. Non-conifer communities show an increase in shrub cover (mostly buckbrush). Other changes include a slow increase in perennial grasses, most likely recovery from historic grazing disturbance. Broadleaved weeds have increased in abundance throughout the allotment as a response to more recent disturbance (livestock, scarifications, roads, and the presence of shrink-swell clays) (Hosten 2007). The spread of bulbous bluegrass, a non-native grass introduced in seeding projects, is problematic for maintaining native dominated communities and can only be indirectly linked to patterns of livestock use (Hosten et al. 2007d).

Root occupancy in the soil profile: The replacement of annual grasses by deeper rooted native perennial grasses over much of the allotment (Hosten 2007d) enhances the nutrient and energy cycles. The increased abundance of bulbous bluegrass is a concern because it functions more like an annual plant.

Soil compaction: The inability of riparian vegetation to extend beyond cut-banks within livestock

exclosures constructed 10 to 20 years ago indicates that soil compaction may be a concern in heavily utilized riparian areas (Hosten 2007b; Hosten and Whitridge 2007). Longer term monitoring will separate the confounding effect of precipitation from soil characteristics such as compaction. The loamy shrub scabland ecological site had a weak compaction layer, not expected for the site most likely as a result of past heavy livestock utilization (USDI 2007).

Fire: While average fire-return interval is longer than immediately prior to settlement by Euro–Americans, the vegetation is still considered to be within the 'natural range of variability' at the stand-level. The loss of meadows, other open vegetation, and early seral brush fields across the landscape (Hosten et al. 2007c) has no precedent in the past several thousand years. Such change at the landscape scale has likely resulted in the loss of special habitats, the stagnation of certain shrub species, and the loss of more palatable browse to native ungulates (Hosten et al. 2007c, USDI 2007). The decline of black oak in stands examined across the landscape is also an indication that the elongated fire return interval is influencing the persistence of long-lived woody species (Hosten et al. 2007d).

Succesional processes: Vegetation plots across the landscape show an increase in native perennial grass abundance, as well as non-native bulbous bluegrass. Patterns of noxious weeds (yellow starthistle, Canada thistle) implicate livestock influence in moderate to severe forage use areas (Map 2), as well as other disturbances and edaphic factors. The increase in buck brush is likely a response to elongated fire return intervals. While patches of chaparral were likely always prevalent within drier portions of the allotment, this expansion of shrubs may alter vegetation dynamics in areas previously kept open by more frequent fire. Long-term domination of formerly open areas may result in the loss of extant grasses and their short-lived seedbank. In the longer term, heavy season -long grazing likely contributed to the increase of woody shrubs through the local extirpation of native perennial grasses (Hosten et al. 2007c). Annual production was less then what would be expected at one of the two sites analyzed (USDI 2007).

Standard 4: Water Quality

To meet this standard, surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

The quality of the water yielded by a watershed is determined by the physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

States are legally required to establish water quality standards and Federal land management agencies are to comply with those standards. In mixed ownership watersheds, agencies, like any other land owners, have limited influence on the quality of the water yielded by the watershed. The actions taken by the agency will contribute to meeting State water quality standards during the period that water crosses agency administered holdings.

Riparian plant community structure influences water quality by shading, thus maintaining lower water temperature. Repeat photos show a general improvement in streamside riparian plant community structure, albeit at a slower rate than change within exclosures.

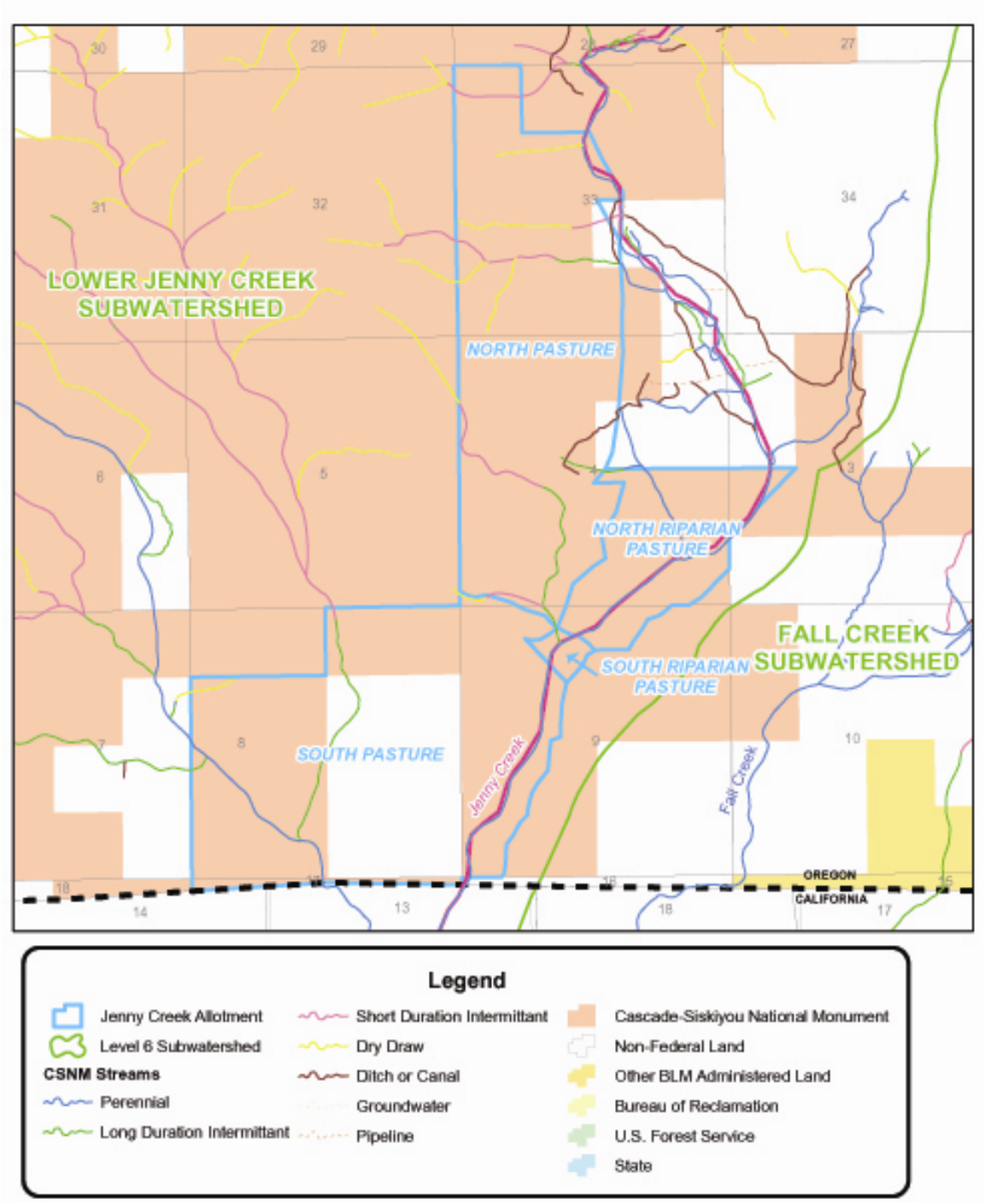
Indicators Used to Evaluate this Standard:

The following set of indicators has been identified for which site-specific criteria will be subsequently used to determine if applicable water quality standards are being met.

Direct measures of water quality: Barr et al. (in prep.) found significantly lower water temperature and higher levels of dissolved oxygen in ungrazed versus grazed springs. Past conversion of seeps and springs to stockponds and the limited size of seeps and springs systems result in livestock concentrations and consequent soil and vegetation impacts preventing recovery of small riparian areas.

The Oregon Department of Environmental Quality (DEQ) is required by the federal Clean Water Act (CWA) to maintain a list of stream segments that do not meet water quality standards for one or more beneficial uses. This list is called the 303(d) list because of the section of the CWA that makes the requirement. The portion of Jenny Creek that flows through the allotment is on the Oregon DEQ's 2004/2006 Environmental Protection Agency approved 303(d) list for summer temperature (salmonid fish rearing) (ODEQ 2006) (Map 3).

Map 3. *Water quality limited stream and Level 6 Subwatersheds in the Jenny Creek Allotment.*



Spring/seep macro-invertebrate community: Disturbance intolerant taxa decline with increased average livestock utilization across the CSNM. Maintenance of intolerant species and species indicative of clean water (*Ephemoptera*, *Plecoptera*, and *Trichoptera*) suggest low to moderate grazing would retain macro-invertebrate species diversity (Dinger et al. 2007).

Streamside macro-invertebrate community: Barr et al. (In review) found that road density,

livestock use, and logging likely acted interdependently to increase fine sediments in first and second order streams. Macro-invertebrate richness and diversity remained high for all four streams examined within the CSNM, and in comparison to other samples within the Utah State University National Aquatic Monitoring Center. Macroinvertebrate surveys conducted at the Jenny Creek lower crossing found cold water biota and intolerant taxa present in low abundance and low richness. Factors contributing to truncation of the macroinvertebrate community include: high (near lethal) summer water temperatures, loss of habitat complexity, and embeddedness (Aquatic Biology Associates 1995).

Streamside riparian Plant Community Cover/structure: Riparian plant community structure influences water quality by shading, thus maintaining lower water temperature. Repeat photos show a general improvement in streamside riparian plant community structure, albeit at a slower rate than change within exclosures (Hosten and Whitridge 2007).

Seep/spring riparian Plant Community Cover/structure: Seeps and springs in the riparian pastures of Jenny Creek Allotment show improvement, but are still subject to periodic concentrated disturbance by livestock.

Beneficial uses: The Jenny Creek Allotment falls within the source water areas for the city Yreka in California. The water source for Yreka is Fall Creek. Fall Creek is outside the Jenny Creek Allotment; however, PacifiCorp diverts up to 16.5 cubic feet per second (cfs) from Spring Creek (also outside the allotment) in the Lower Jenny Creek Subwatershed (Map 3) for hydroelectric power and transports this water via an open earthen canal to Fall Creek above the intake for the City of Yreka. The PacifiCorp diversion and all but approximately 100 feet of the canal (approximately 2,400 feet in length) are located on BLM-administered lands.

A source water assessment has been completed by the California Department of Health Services for the City of Yreka. The assessment includes an inventory of potential contaminant sources within the source water areas. The City of Yreka source water assessment identified open range cattle as a potential contaminating activity. No other potential contaminant sources that could occur on BLM lands were identified in the state source water assessment.

Road density: Roads may alter the groundwater and surface flow patterns locally and may create an imbalance in hydrologic systems. Natural and graveled road surfaces, road cuts, fill slopes, and ditch lines are subject to erosion. Ditch lines that are not effectively drained by relief culverts (cross drains) act as extensions of stream networks that deliver fine sediment, as well as intercepted ground and surface water directly into stream channels. Research (Jones and Grant 1994; Wemple 1994; Wemple, et al. 1996) suggests that roads that contribute to the extension of the stream channel network are related to changes in the timing and magnitude of peak flows. Road cuts intercept subsurface flow, effectively increasing the amount of surface flow, and the ditch lines allow the water to move through the stream systems quicker. The Jenny Creek Allotment is located entirely within the Lower Jenny Creek Level 6 Subwatershed. The road density within the Lower Jenny Creek Subwatershed is 2.95 mi./mi.^{2}.

Road density within the Riparian Reserves of the entire (BLM lands only) CSNM is 3.75 mi./mi.^{2} (USDI In prep.). Roads within riparian areas can greatly influence aquatic and riparian conditions. Roads contribute to the disruption of aquatic connectivity, large wood and nutrient storage regimes, peak flow routing, aquatic habitat complexity, temperature regimes, channel morphology, and direct sediment inputs from road failures. The matrix of pathways and indicators for the Klamath Province/Siskiyou Mountains considers road densities of less than 2.0 mi./mi.^{2} as properly functioning condition and greater than 3.0 mi./mi.^{2} as not properly

functioning (ODFW 2002, 2003).

Standard 5: Native, T&E, and Locally Important Species

To meet this standard, habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform.

Federal agencies are mandated to protect threatened and endangered species and will take appropriate action to avoid the listing of any species. This standard focuses on retaining and restoring native plant and animal (including fish) species, populations and communities (including threatened, endangered and other special status species and species of local importance). In meeting the standard, native plant communities and animal habitats would be spatially distributed across the landscape with a density and frequency of species suitable to ensure reproductive capability and sustainability. Plant populations and communities would exhibit a range of age classes necessary to sustain recruitment and mortality fluctuations.

Studies examining special status species are restricted to *Calochortus greenei* and aquatic mollusks. Apart from influence on plant community composition, described elsewhere, the interaction between native ungulates, small mammals, and butterflies are also considered relevant influences on locally important species.

C. greenei seedlings are thought to be susceptible to competition by annual grass seedlings (Frost and Hosten 2007). A recent exclosure cage study indicates that the size and reproduction are influenced by livestock, particularly in areas of higher livestock use in the Agate Flat Pasture of the Soda Mountain Allotment (Menke and Kaye 2006).

Indicators Used to Evaluate this Standard:

The following set of indicators has been identified for subsequent use to determine if this standard is being met.

Native ungulate interaction with livestock: While livestock and hunters were both found to influence native ungulate movements, these influences are considered less biologically relevant than suburban and agricultural expansion into winter range. While historic use of browse species important to deer and elk was documented in the past, current levels of utilization have been reduced by amending the timing and intensity of livestock grazing. Historic browsing by livestock within current day winter deer and elk habitat is thought to have contributed to winter native ungulate die-off. Changes in the timing and intensity of grazing has significantly reduced the level of browsing (Hosten et al. 2007a), thus eliminating the conflict between native and non-native ungulates. Shrub growth in previously reported areas of heavy browsing now appears normal (Hosten et al. 2007a). Observation in areas that have not burned for many decades show shrub stagnation, likely an influence of elongated fire return interval rather than livestock influence.

Small mammal community composition, productivity: Richness and diversity of small mammals is not influenced by livestock grazing in riparian, woodland, and mixed conifer communities, small mammal biomass is less in grazed versus ungrazed areas. However, a study of small mammals on the monument indicates that several small mammals are reduced in number in areas of moderate to severe use. Total small mammal biomass is also reduced in moderate to severe use areas by 138 g/ha (Johnston and Anthony In review a, b).

Birds: Ungulate use appears to lead to an increase in abundance of ground nesting birds, but may not favor overall reproductive success by these species. This may result from a decrease in the cover of shrubs which provides more nest sites for ground-nesting birds. Ungulate use has a negative influence on abundance of shrub-nesting birds including migratory neo-tropical birds (Alexander et al. 2008). It is not known if the increased abundance of shrubs found in formerly open fire-mediated plant communities (Hosten et al. 2007c) compensates for livestock influence on shrub nesting bird species.

Butterflies: Ungulate utilization has been shown to negatively influence the Great Basin wood nymph, a butterfly dependent on grass species for its lifecycle. Other butterflies with grass host plants (e.g. mardon skipper) may experience similar negative influences (Runquist In prep.).

Patterns of aquatic macro-invertebrates with ungulate use: A study examining patterns of aquatic macro-invertebrates in streamside riparian influence found that the combined influence of road density, logging, and livestock reduced aquatic macroinvertebrate richness (Barr et al. In review). Studies in seeps and springs found that high diversity and species indicative of clean water were compatible with low to moderate ungulate use (Dinger et al. 2007). Higher use resulted in a loss of "intolerant species. A strong geographic influence suggests that a subset of springs throughout the monument need to be conserved to maintain beta diversity.

Patterns of aquatic mollusks with livestock use: There were no statistically significant associations of Aquatic mollusk richness with livestock utilization (Barr et al. In prep.).

Habitat elements and connectivity (*Calochortus greenei*): Recent surveys have located many new *C. greenei* populations within the monument, suggesting that habitat connectivity is not an issue. It is likely that historic grazing by livestock and conversion of open habitat to woody vegetation domination may have resulted in the loss of the grass-shrub ecotone favored by *C. greenei*. Neither is it known if the loss of meadows, grassy interspaces, and increased density of woody vegetation consequent to the time elapsed since the last fire influences the persistence of *C. greenei*.

Spatial distribution of habitat: Yearlong livestock grazing at stocking rates approximately 10 times the current converted some historic perennial bunchgrass to weeds. The consequent reduction in competition together with elongated fire-return interval resulted in the loss of open fire-mediated grasslands (Hosten et al. 2007c). The current predisposition of *C. greenei* for shrub-grassland interfaces indicates that historic conversion to shrublands may have resulted in the loss of habitat (Frost and Hosten 2007). More recent repeat photos indicate an increase in shrub density and canopy cover (particularly by *Ceanothus cuneatus*). These changes are more likely a consequence of time elapsed since the last fire than a response to livestock grazing.

Plant community composition (general): There is little doubt that livestock strongly influenced vegetation at the end of the 19th and early 20th centuries when stocking rates were ten times higher than the current (Hosten et al. 2007a). Studies indicate that many plant communities are still recovering from past livestock-induced annual grass domination (Hosten et al. 2007d). More recent invasion by bulbous bluegrass (introduced as a consequence of range seedings) and its preference for gentle slopes is an indirect measure of livestock influence on bulbous bluegrass invasion (Hosten et al. 2007d). It is not known if livestock are impeding recovery of upland plant communities towards perennial grass domination in areas of current livestock use away from sites currently dominated by broadleaved weeds. Repeat photos show considerably more buckbrush in recent times; this has likely resulted in a concomitant decline in the herbaceous component in some areas. Studies indicate that livestock are impeding the development of riparian vegetation

associated with seeps and springs. Past conversion of seeps and springs to stockponds and the restricted area of seeps and springs result in livestock concentrations and consequent soil and vegetation impacts preventing recovery of small patches of riparian vegetation (Hosten and Whitridge 2007).

Age class distribution: Repeat photos show an increase in seed obligate and resprouter species through much of the allotment negating the concern about uneven age class distribution in most shrub species. Few decadent bunchgrasses have been noticed any where in the monument. The only problem with age class distribution may be associated with *Calochortus greenei* (see federally listed and bureau sensitive status vascular plants). The reproductive capability of perennial plants was reduced to a slight-to-moderate departure at the loamy shrub scabland site (USDI 2007).

Bureau Special Status terrestrial wildlife: The following species are known or suspected to occur in the Jenny Creek Allotment (Table 2).

Table 2: *Special Status Species (Terrestrial Wildlife)*

Species	**Species Status**
northwestern pond turtle (*Actinemys marmorata marmorata*)	BS
pallid bat (*Antrozous pallidus*)	BS
fringed myotis (*Myotis thysanodes*)	BS
Lewis' woodpecker (*Melanerpes lewis*)	BS
foothills yellow-legged frog (*Rana boylii*)	BS

BS - Bureau Sensitive

BLM recently issued interim guidance for meeting BLM's responsibilities under the Migratory Bird Treaty Act and Executive Order 13186. Both the Act and the EO promote the conservation of migratory bird populations. The interim guidance was transmitted through Instruction Memorandum No. 2008-050. The I.M. relies on two lists prepared by the U.S. Fish and Wildlife Service in determining which species are to receive special attention in land management activities; the lists are *Bird Species of Conservation Concern* (BCC) found in various Bird Conservation Regions and *Game Birds Below Desired Condition* (GBBDC). Table 3 displays those species that are known or likely to present on the allotment.

Table 3. *Bird Species of Conservation Concern*

Species	**Status**
black-throated gray warbler (*Dendroica nigrescens*)	BCC
flammulated owl (*Otus flammeolus*)	BCC
golden eagle (*Aquila chrysaetos*)	BCC
Lewis' woodpecker (*Melanerpes lewis*)	BCC
olive-sided flycatcher (*Contopus cooperi*)	BCC
prairie falcon (*Falco mexicanus*)	BCC
rufous hummingbird (*Selasphorus rufus*)	BCC
mourning dove (*Zenaida macroura*)	GBBDC

BCC - Bird of Conservation Concern
GBBDC- Game Bird Below Desired Condition

Except for rufous hummingbird and mourning dove, grazing has no or only minor impacts on the other species because it does not physically reduce their numbers nor does it reduce feeding,

breeding and sheltering opportunities. Rufous hummingbird and mourning dove can be affected by reduced foraging opportunity.

Livestock grazing affects wildlife by changing vegetation composition, structure, and function. Grazing can result in a reduction of forage available to native herbivores (e.g. deer and elk), as well as reductions in vegetative ground cover for ground-nesting birds, burrowing rodents, and other wildlife species dependent on ground cover for protection, food, and breeding sites. The mere presence of livestock can also change local distribution and habitat use by native species (Hosten et al. 2007b). Generally, the extent of impacts to individual T&E species and their habitats are unknown.

Except for some riparian areas that are heavily grazed in the oak-woodland and meadow plant communities, it appears, subjectively, that the allotment is moderately grazed in most years (Map 2).

The foothills yellow-legged frog is associated with low gradient streams and depends on the aquatic environment for of its entire life cycle. This species is impacted by issues of water quality and habitat degradation (trampling, wading, and consumption of vegetation) which may be caused by livestock.

The northwestern pond turtle is present in various locations along Jenny Creek. Northwestern pond turtle spend the majority of their life cycle in aquatic environs, but must leave the water to dig terrestrial nests and lay their eggs. These turtles often overwinter in upland settings as well. Both of these activities may be impacted by grazing, and post-holing by livestock.

Big Game Winter Range Area

The allotment is within Big Game Winter Range for deer and elk designated by the Medford District RMP (1995). This designation is meant to identify areas to promote forage, and hiding and thermal cover for deer and elk (USDI 1994a). Current grazing has little influence on hiding and thermal cover conditions, but it does affect forage conditions.

There is little diet overlap between livestock and deer, but there is an overlap of preferred forage between livestock and elk. There is a tendency of both deer and elk to avoid areas being grazed by cattle. However, this tendency was not present when elk were on their winter range at which time they were observed utilizing the same pasture as livestock. This is likely due to constraint of forage and browse resources by snowfall (Hosten et al. 2007b). The effect of grazing in this allotment has minimal impact to designated Big Game Winter Range; however, reduced forage from heavy grazing during spring, summer, and fall has detrimental effects on big game species.

Bureau Special Status aquatic species: The following list is known or suspected to occur in the Jenny Creek Allotment (Table 4).

Table 4*: Special Status Species (Aquatic)*

Species	**Species Status**
Jenny Creek redband trout	BS

BS- Bureau Sensitive

Jenny Creek supports populations of native Jenny Creek redband trout (*Oncorhynchus mykiss)*, considered "sensitive" on the Final Interagency Special Status/Sensitive Species List (April 19, 2007). In the Klamath River system, Southern Oregon/Northern California (SONC) coho salmon (*Oncorhynchus kisutch*), a "threatened" species under the Endangered Species Act (ESA) are

restricted to habitat below Irongate Reservoir located approximately nine miles downstream of the Jenny Creek Allotment. Jenny Creek suckers (*Catostomus rimiculus*), and speckled dace (*Rhinycthyes osculus*) are other native species known to occur in the system.

This area is known to support populations of Special Status aquatic mollusks though they have not been documented within the allotment boundary. A study examining patterns of aquatic macro-invertebrates in streamside riparian influence found that the combined influence of road density, logging, and livestock reduced aquatic macroinvertebrate richness (Barr et al. In prep.). Studies in seeps and springs found that high diversity and species indicative of clean water were compatible with low to moderate ungulate use. Moderate to heavy use as measured by average utilization has resulted in a loss of intolerant species across the monument. A strong geographic influence suggests that a subset of springs throughout the monument need to be conserved to maintain beta diversity. There were no statistically significant associations of aquatic mollusk richness with livestock utilization (Dinger et al. 2007). *Fluminicola sp.* have not been observed within the allotment boundary however, there are known to occur in the Jenny Creek and Spring Creek drainages and the allotment is adjacent to an endemic hot spot (Frest and Johannes 2005).

Effects to T & E Species, Special Status Species, and their habitat include: 1) no effect to coho salmon or Coho Critical Habitat (CCH) as the nearest CCH is nine miles downstream, below a reservoir that acts as a sediment trap in all but the worst flood conditions; 2) Increases in fine sediment would occur where cows have direct access to streams. These fine sediment increases would negatively impact Jenny Creek suckers, Jenny Creek redband trout, and other aquatic organisms in this system that has existing high levels of fine sediment and a limited capacity to move sediment naturally as the reservoir system moderates the magnitude and intensity of winter flushing flows.

Bureau Sensitive Status fungi, lichens, and bryophytes:
Currently there are no known occurrences of Bureau Special Status fungi, lichens, or bryophytes within the allotment area.

Federally Listed and Bureau Sensitive Status Vascular Plants: The following Bureau Special Status vascular plant occurs in the Jenny Creek Allotment (Table 5).

Table 5*: Special Status Species (Vascular Plants)*

Species	**Species Status**	**Occurrences***
Greene's mariposa-lily *(Calochortus greenei)*	BS	1

BS - Bureau Sensitive
*Occurrences can be used synonymously with populations and meta-populations.

No occurrences of *Fritillaria gentneri* or any other federally listed plant species are known on federal lands within the allotment. The allotment is outside of the range of other federally listed plants recognized by the U.S. Fish and Wildlife Service (*Limnanthes floccosa, Arabis macdonaldiana,* and *Lomatium cookii*) (USDI Fish and Wildlife Service 2003).

C. greenei population stability/resilience: Insects, small mammals, native ungulates, as well as livestock ingest *C. greenei* as a food-source. Exclosure cages indicate that livestock reduce plant size and reproduction in higher livestock use areas (as defined by the average utilization map) (Menke and Kaye 2006) Livestock influence also occurs through the influence of the surrounding plant community. Livestock management favoring annual grasses likely favors against the persistence of *C. greenei* by allowing annual grasses to compete against native *C. greenei* seedlings.

Noxious weeds:
Field surveys have located a number of noxious weed species within the allotment, including yellow star thistle (*Centaurea solstitialis*), Dyer's woad (*Isatis tinctoria*), and medusahead (*Taeniatherum caput-medusae*). Many of the weed populations occur along roads or in areas historically disturbed by forestry operations. In the non-conifer habitats preferred by livestock, medusahead and other exotic annual grasses are present in most meadows, and dominant in some areas. While medusahead (a noxious annual grass) shows instances of decline and increased abundance across the landscape, bulbous bluegrass shows consistent increases in cover across all ecological sites where it is found across the monument (Hosten et al 2007d).

Broadleaved noxious weed invasion indicate areas of deteriorating plant composition. Sites with yellow starhtistle are associated with several environmental and management factors including the presence of shrink-swell clays, grazing by livestock, past management activities such as road construction, scarification and seeding (Hosten 2007a).

The RHFA indicate that there is a moderate departure in a loamy shrub scabland ecological site and a moderate-extreme departure in a loamy slopes ecological site (Indicator 16, USDI 2007). Due to their invasive nature, noxious weeds present on the allotment can continue to spread when left untreated. Field visits to the allotment and BLM monitoring data suggests exotic annual grasses are not spreading rapidly under current grazing regimes. However, areas of moderate to heavy livestock utilization, areas with shrink swell clays, congregation areas (salt blocks, water sources, shade), along roads and other areas that experience soil and vegetation disturbance within the allotment are at risk for weed colonization. The BLM weed control program uses herbicides, biological control agents, and hand-pulling to treat infestations across the landscape.

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